

Remarks

In the final Office action, claims 22-28, 30, 35, and 38 were rejected under 35 U.S.C. § 102(b), as being anticipated by U.S. Patent No. 5,463,200 to James et al. (“James et al.”). In addition, claims 29, 36 and 37 were rejected under 35 U.S.C. 103(a) as being unpatentable over James et al. in view of U.S. Patent 4,911,711 to Telfair et al. (“Telfair et al.”). Claims 43-45 were allowed and claims 31-34 were deemed to be directed to allowable subject matter.

In this response, claims 22, 35, and 43 have been amended and new claims 46-51 have been added. Upon entry of the amendments, claims 22-38, and 43-51 will be pending. Reconsideration and withdrawal of the rejections and objections in view of the amendments and following remarks is hereby respectfully requested.

A. Rejections under 35 U.S.C. § 102(b):

Claims 22-28, 30, 35, and 38 were rejected under 35 U.S.C. § 102(b), as being anticipated by U.S. Patent No. 5,463,200 to James et al. (“James et al.”).

James et al. describes a method of marking a workpiece by light energy, e.g. a pulsed laser beam in order create a selected pattern on the workpiece that combines “the focused spot and mask imaging techniques, in that, while the pattern is made of selected ones of an array of dots, all these dots are formed on the workpiece simultaneously.” Column 3, lines 6-10.

Independent Claim 22:

In responding to Applicants’ arguments from the previous response, the Examiner stated that the term “influences the intensity distribution” in claim 22 was being interpreted as “being broader/different than the phrase ‘changing the intensity distribution’” and suggested amending the limitation to recite that the microoptically active structure “alters” the intensity distribution of a laser beam. See Final Office Action at page 6.

Applicants have amended independent claim 22 as suggested by the Examiner to replace the term “influences” with the term “alters” to make clear that “the intensity distribution in the laser beam cross section” is altered and not merely influenced “in such a way that the laser beam, after passing through said optical element, has a bell-shaped or Gaussian intensity distribution, or an intensity distribution similar to a bell-shaped or Gaussian distribution, in at least one cross-sectional direction.” Applicants respectfully submit that James neither describes nor suggest the

feature of a microoptically active structure altering the intensity distribution in the laser beam cross section in the manner recited in claim 22. Instead, the microlens array 14 having lenslets 16 is used with mask 22 to split the laser beam into beamlets 18 and form a pattern. There is no suggestion within James for altering the intensity distribution of the laser beam cross section such that the laser beam, after passing through the optical element has the recited intensity distribution.

Applicants respectfully request withdrawal of the rejection to independent claim 22 and to claims 23-28, and 30 which depend from claim 22.

Independent Claim 35:

Independent claim 35 recited a process for shaping objects through material removal from the surface of the object. The process includes the steps of guiding a pulsed laser beam so as to move the laser beam over the object surface, and:

changing a characteristic of the laser beam entering the object during the shaping using an optical element having a microoptically active structure, wherein the characteristic includes at least one of the distribution of the radiation intensity within the laser beam, the size of the spot area with which the laser beam strikes the object surface, and the deflecting angle for the laser beam.

Applicants have amended claim 35 to more specifically recite that the guiding is performed so as to move the laser beam over the surface and that a characteristic of the beam entering the object is being changed using an optical during the shaping. The characteristic includes at least one of the following: a distribution of the radiation intensity within the laser beam, the size of the spot area with which the laser beam strikes the object surface, and the deflecting angle for the laser beam.

Applicants respectfully submit that James et al. neither describes nor suggests at least the step of changing a characteristic of the beam entering the object “during the shaping” as recited in claim 35 and discussed in applicants specification, for example at page 6, lines 16-22. On the contrary, the microlens array 14 of James, identified by the Examiner as corresponding to the optical element of the claim, is not equipped to change a characteristic of the beam entering the object “during the shaping”. Instead James et al. teaches adjustment means 20A for moving the workpiece 20 with respect to the focal plane FP to change the size of the spots, for example.

Accordingly, withdrawal of the rejections to claims 35 and 38 is respectfully requested.

B. Rejections under 35 U.S.C. § 103:

Claims 29, 36 and 37 were rejected under 35 U.S.C. 103(a) as being unpatentable over James et al. in view of Telfair et al. Claim 29 depends from independent claim 22 and claims 36 and 37 depend from independent claim 35.

As discussed above, Applicants submit that James does not suggest the feature of a microoptically active structure altering the intensity of the intensity distribution in the laser beam cross section in the manner as recited in claim 22. Also, as discussed above, Applicants submit that James does not suggest the feature of changing a characteristic of the beam entering the object using an optical element having a microoptically active structure “during the shaping” as recited in claim 35.

Applicants further submit that Telfair et al. does not cure the deficiency of James et al. On the contrary, Telfair et al. describes a sculpture apparatus for correcting the curvature of the cornea that uses a beam shaping means 22. Beam shaping means includes various anamorphic elements 50-51 and spatial filter 52 to shape and homogenize the beam. See Fig. 2. There is no suggestion for a microoptically active structure altering the intensity distribution of the beam in the manner recited in independent claim 22. Moreover, with respect to independent claim 35, Telfair et al. merely describes various macro-optical filters A-F. Moreover, Telfair et al. teaches away from the present invention in many respects, since it is directed to a different application that is solely adapted for full ablation of the eye. Telfair et al. describes adapting a large beam 10 having cross-sectional dimensions of 22 mm by 7mm and adapting the beam to “a large homogeneous circular beam 10” having a diameter 14 mm before being adapted to a 5 to 7 mm diameter “ultimately delivered to the eye.” See column 3, line 47 to column 4, line 38. Telfair et al. therefore teaches away from at least the step of “guiding a pulsed laser beam so as to move the laser beam over the object surface” as recited in claim 35.

Withdrawal of the rejections under 35 U.S.C. 103 is respectfully requested.

C. Additional Amendments to Independent Claims 22, 35, and 43:

In addition to the amendments to independent claims 22 and 35 discussed above, Applicants have amended those claims to remove a limitation that had been earlier added in an Amendment filed on August 24, 2003. Specifically, Applicants have deleted the feature that the

microoptically active structure has a diffractively active element structured in the micrometer range whose dimensions approximately correspond to the wavelength of the pulsed laser beam. In addition, Applicants have amended independent claim 43 to delete the term “diffractive”.

Applicants specification describes an optical element that is not so limited, but that specifically includes “a diffractive and/or refractive and/or holographic microoptically active structure. See page 4, lines 14-16.

Applicants respectfully submit that a diffractive microoptically active structure is not necessary for patentability. Rather, it appears that the feature was added following a misunderstanding between the Examiner and the Applicants as shown in the Amendment filed on November 21, 2002 and the Office Action dated February 24, 2003. Specifically, the Examiner appears to have understood Applicants’ arguments in the Amendment filed on November 21, 2002 as an attempt to distinguish over the cited prior art on the basis of diffractive microoptics. However, such a distinction was not necessary for several reasons. For example, the outstanding rejection at the time was based on Telfair et al. in view of WO 00/10049 to Elbrecht, the latter of which is not even prior art to the present application. Nor does a distinction based on diffractive microoptics appear to affect any subsequent rejections to the claims. For example, the later double patenting rejection based on U.S. Patent No. 6,537,270 was overcome on the basis of the Gaussian distribution limitation of claim 22 and not on the basis of any diffractive microoptic structure limitation. Applicants respectfully submit that the feature that the microoptics be diffractive is not necessary to overcome the current or any previous rejection in the current prosecution.

Furthermore, Applicants respectfully submit that the specific dimensional limitations on the microoptically active structure are likewise not necessary for patentability. “Microoptics” is a well known and growing field within the broader field of optics. A person reasonably skilled in the art of optics and microoptics, would readily understand the meaning of the phrase “microoptically active structure” as described in the Applicants’ specification and recited in the claims. See, for example, beginning at page 4, line 19. Several of the numerous prior art references cited and considered in this application, including, but not limited to James et al., provides ample evidence that a person of ordinary skill in the art would adequately understand the meaning of the phrase microoptically active structure. Applicants respectfully submit that

even a broad reading of that feature would not affect patentability, at least based upon the references that have been cited thus far in the application.

D. New Claims 46-51:

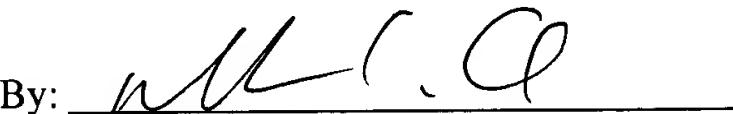
New claims 46-49 and 51 depend from independent claim 22 and new claim 50 depends from claim 35. Claims 46-48 further define the microoptically active structure as being a diffractive, refractive, and holographic microoptically active structures, respectively, as described in the specification. Claims 49 and 50 further define "the object" of claim 22 (and claim 35 respectively) to include an eye, as also described in the specification, so as to further distinguish from James et al. and other references. Claim 51 further defines the pulsed laser beam as an excimer laser beam.

CONCLUSION

It is respectfully submitted that the application is now in condition for allowance.

Respectfully submitted,

DAVIDSON, DAVIDSON & KAPPEL, LLC

By: 
William C. Gehris, Reg. No. 38,15
(signing for Thomas P. Canty, Reg. No. 44,586)

Davidson, Davidson & Kappel, LLC
485 Seventh Avenue - 14th Floor
New York, New York 10018
(212) 736-1940